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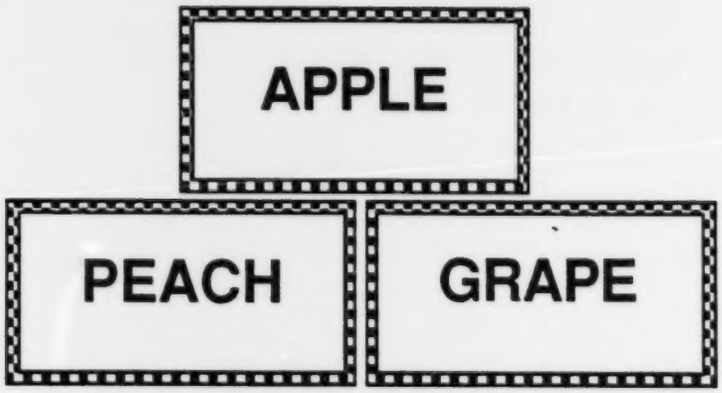
ESTIMATED ESTABLISHMENT COSTS
ONTARIO, 1987



ECONOMICS AND POLICY
COORDINATION BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
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Material in this report is based on information believed to be accurate at the time of publication; however, accuracy is not guaranteed. The crop production estimates result from a review of information from different sources and are based on many assumptions including estimates of land costs, levels of fertilizer use and cultural practices followed. Regional differences in crop production may result in variation in costs of production.

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ECONOMICS INFORMATION

REPORT NO. 87-06

APPLE, PEACH AND GRAPE

ESTIMATED ESTABLISHMENT COSTS

ONTARIO, 1987

by

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INTRODUCTION

Since 1948, the Economics and Policy Coordination Branch has carried out comprehensive studies of major field and horticultural crops grown in Ontario. These studies were designed to determine costs and returns of various farm enterprises, as well as the physical amounts of production inputs required.

Traditionally, data was collected by means of farmer interviews. Published reports of these studies in the form of county, regional and provincial averages found a wide distribution among extension and research personnel, educational institutions, farm organizations, lending institutions and policy makers. Cooperating farmers received reports showing their individual information in comparison with group averages.

With this extensive background in the development of cost studies, the Economics and Policy Coordination Branch has begun to use computers in the preparation of cost data. Methods of computer simulation have now replaced the time consuming process of data collection, tabulation and analysis.

With this new approach, special attention is paid to the physical quantities and prices of inputs for each crop studied. The technology used in the production of various crops is carefully examined so that the computer models accurately reflect the appropriate production technology for each commodity.

Information on physical inputs is obtained from a number of sources, including:

1. Previous studies done by this Branch;
2. Surveys of the farm supply trade;
3. Technical input/output coefficients; and
4. The consensus of producers, researchers, and extension and agribusiness personnel.

THE DEVELOPMENT OF THE ACRES PROGRAM

A large number of computer programs that generate budgets and crop production cost estimates are now in existence. These computer programs vary in their degree of sophistication and in the amount of detail prepared. A large number of estimates covering a wide range of conditions can be generated quickly and efficiently. The effect of varying levels of technology, management practices and price levels can also be analyzed.

Cost of production estimates used in this report are based on the ACRES program. ACRES (Agricultural Crop Enterprises System) is a FORTRAN program originally written in Montana, adapted by Alberta Agriculture and recently modified and rewritten by the Economics and Policy Coordination Branch to meet Ontario conditions. All 1987 cost of production estimates in this report are based on this computer model.

METHODS AND PROCEDURES

The information used in the preparation of each establishment cost estimate in this report was prepared through the use of recent Economics and Policy Coordination Branch studies, plus consultations with producers, extension, research and agribusiness personnel.

For each crop cost estimate in this report, the data was organized into variable and fixed costs and totalled to arrive at the cost of establishment both on a per acre and per hectare basis. Variable costs are those which vary directly with the production of each crop grown. They include seed, plants, hired labor, fertilizer, herbicides, insecticides, fungicides, other materials, machinery operating costs, and interest on operating capital. Fixed cost inputs are operator labor, interest on land and machinery, depreciation on machinery, taxes on real estate (net of farm tax rebate), and other overhead cost items.

LABOR HOURS AND COSTS

The required number of labor hours was based on previous studies, as well as through discussions with those familiar with the production of each study crop. The operator labor hours were valued at $7.00 per hour.

The hired labor cost was calculated on a per hour basis and included benefits such as worker compensation, unemployment insurance, and the Canada Pension Plan. The rates varied according to area, crop and skill involved.

MATERIALS

The amount of each material input was based on commonly used practices. Input prices are based on averages charged by the trade in the area where the particular crop is grown. For most crops, the quantities of seed, plants, fertilizer nutrients and other inputs are given on a per hectare basis. Because of the multitude of products available, pesticides are grouped as herbicides, insecticides, fungicides, nematicides, etc.

TRACTORS, MACHINES AND TRUCKS

Machinery complements used in the various crop production cost estimates were assumed to be five years old. Tractor and machine costs included depreciation, interest on investment, insurance, storage, repairs, maintenance, fuel and lubrication. If machines were used for other farming operations, costs were adjusted based on the proportion of use on the study crop. The declining balance method of depreciation was used, and a 15 percent rate to powered and a 10 percent rate to non-powered machines was applied.

Interest on machinery investment was calculated on the assumption that the equity portion was 70 percent and the debt portion was 30 percent of the total depreciated value. For this report, interest on equity was calculated at 4.6 percent, which was the average interest rate paid by chartered banks on savings accounts. The interest on the debt portion was based on the average prime rate of 9.0 percent, plus one for a total of 10.0 percent. Insurance and storage costs for machinery were based on 1.5 percent of their purchase price.

Repair and maintenance costs for individual machines were based on the fact sheet, "Cost of Owning and Operating Farm Machines", Agdex 825, Ontario Ministry of Agriculture and Food.

Fuel costs were based on the size of each tractor, truck or self-propelled machine used in the production opration. The following farmgate fuel prices were used: gasoline - 32.0 cents/litre; diesel - 33.0 cents/litre. The cost of oil, grease and filters was calculated at 15 percent of the fuel cost.

CUSTOM FARMWORK SERVICES

There are crops produced in Ontario where it is an accepted practice to use custom farmwork services to perform certain operations. Usually, these services are employed when the farmer needs specialized machines, such as harvesters, sprayers, fertilizer applicators and trucks. Most of these machines cannot be economically owned and operated by one producer. Custom costs were itemized on a per hectare or per acre basis.

LAND CHARGES

Determining the annual cost for land use is a controversial part in any study on production costs. During the past two decades, purchasers of farmland have been willing to pay more for it than can be justified from agricultural production. Purchasers believe the speculative aspect of land ownership in inflationary times offers benefits above those received from crop production. In deflationary times, however, this situation is reversed. For this reason, the appropriate interest rate used in calculating the interest cost on bare land for these crop production estimates is the real interest rate. The "real interest rate" is defined as the current lending rate of interest adjusted for inflation.

In this report, interest on land investment was calculated as follows:

1. The value of bare land was based on the average value for land in areas of Ontario where the production of each study crop predominates.

2. The interest rate applied was the prime rate discounted for the rate of inflation, which resulted in a 6.3 percent rate.

The farm real estate taxes used for each study crop reflect the area of production and are subject to Ontario's Farm Tax Reduction Program.

INTEREST ON OPERATING CAPITAL

Interest on operating capital required to finance each crop was calculated from the time an expenditure was made until the end of the fourth year of establishment. Operating capital includes the cost of materials, fuel, repairs, hired labor and other cash items. In this study, the interest rate applied to operating capital was the average prime rate of 9.0 percent plus 1 percent.

OTHER OVERHEAD

This allowance covers such items as the study crop's share of utilities, accounting and administration costs, use of the farm automobile, and general farm assistance.

APPLE ORCHARD ESTABLISHMENT

The apple orchard under consideration is planted on semi-dwarf rootstock at a medium density of 300 trees per acre. The establishment of this orchard covers a 4½ year period: a half year for soil preparation, one year for planting, and three years for the trees to grow to bearing age.

Table 1. - Apples on Size-Controlling Trees, "Preplant Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Fertilizer, 15-15-15 250 kg/ha	54	22
Cover crop seed	12	5
Fumigant	455	184
Tractor and machine costs:		
Repairs and maintenance	19	8
Fuel	26	10
Custom fumigation	25	10
Interest on operating capital	220	89
TOTAL	811	328
FIXED COSTS		
Operator labor, 11.1 hours/ha	78	31
Tractor and machine costs:		
Depreciation	46	19
Interest on investment	20	8
Insurance and housing	10	4
Interest on land, $4,450/ha @ 6.3% annum (½ yr.)	140	57
Taxes (½ year)	21	8
TOTAL	315	127
TOTAL "PREPLANT YEAR" COSTS	1,126	455

Table 2. - Apples on Size-Controlling Trees, "Preplant Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Discing	2	2.47	1.0	42.97	17.39
Cultivating	1	1.24	.5	27.33	11.06
Sowing cover crop	1	2.47	1.0	32.52	13.16
Plowing	1	2.47	1.0	51.08	20.67
Soil packing	1	2.47	1.0	45.07	18.24

Table 3. - Apples on Size-Controlling Trees, "Planting Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 87.7 hours/ha	316	128
Fertilizer, 15-15-15 250 kg/ha	54	22
Insecticides	91	37
Fungicides	171	69
Herbicides	101	41
Trees, 300 semi-dwarf	3,521	1,425
Tree guards, 300	334	135
Mouse bait, 5.6 kg/ha	10	4
Tractor and machine costs:		
Repairs and maintenance	132	54
Fuel	174	70
Equipment rental	124	50
Interest on operating capital	1,760	712
TOTAL	6,788	2,747
FIXED COSTS		
Operator labor, 85.3 hours/ha	597	242
Tractor and machine costs:		
Depreciation	265	107
Interest on investment	107	43
Insurance and housing	51	21
Interest on land, $4,450/ha @ 6.3% per annum	280	113
Taxes	41	17
Other overhead	99	40
TOTAL	1,440	583
TOTAL "PLANTING YEAR" COSTS	8,228	3,330

Table 4. - Apples on Size-Controlling Trees, "Planting Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Discing	2	2.47	1.0	38.01	15.38
Design and layout	a	19.8	8.0	164.48	66.56
Digging holes	1	24.7	10.0	499.41	202.10
Planting	1	59.3	24.0	340.44	137.77
Watering	1	9.88	4.0	178.81	72.36
Fertilizing	1	4.94	2.0	47.17	19.09
Weed spraying	2	4.94	2.0	95.53	38.66
Discing	3	3.71	1.5	57.06	23.09
Pesticide spraying	3	3.71	1.5	121.13	49.02
Summer management	a	12.4	5.0	86.49	35.00
Installing tree guards	1	24.7	10.0	128.94	52.18
Applying mouse bait	1	2.47	1.0	8.65	3.50

[a]Operation performed as required.

Table 5. - Apples on Size-Controlling Trees, "Second Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 13.6 hours/ha	61	25
Fertilizer:		
15-15-15 250 kg/ha	54	22
Am. nitrate 125 kg/ha	22	9
Insecticides	240	97
Fungicides	245	99
Herbicides	126	51
Trees, 15 replacements	175	71
Cover crop seed	84	34
Mouse bait, 5.6 kg/ha	10	4
Tractor and machine costs:		
Repairs and maintenance	88	36
Fuel	74	30
Interest on operating capital	295	119
TOTAL	1,474	597
FIXED COSTS		
Operator labor, 66.7 hours/ha	467	189
Tractor and machine costs:		
Depreciation	156	63
Interest on investment	70	28
Insurance and housing	34	14
Interest on land, $4,450/ha @ 6.3% per annum	280	113
Taxes	41	17
Other overhead	99	40
TOTAL	1,147	464
TOTAL "SECOND YEAR" COSTS	2,621	1,061

Table 6. - Apples on Size-Controlling Trees, "Second Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Replanting trees	a	9.88	4.0	90.42	36.59
Pruning and training	a	19.8	8.0	138.38	56.00
Fertilizing	2	7.41	3.0	79.69	32.25
Weed spraying	2	4.94	2.0	95.53	38.66
Discing	2	2.47	1.0	38.03	15.39
Pesticide spraying	5	7.41	3.0	242.27	98.04
Summer management	a	17.3	7.0	121.08	49.00
Discing and harrowing	2	3.71	1.5	60.10	24.32
Sowing cover crop	1	2.47	1.0	27.58	11.16
Applying mouse bait	1	2.47	1.0	8.65	3.50
Spot weed control	a	2.47	1.0	47.77	19.33

[a]Operation performed as required.

Table 7. - Apples on Size-Controlling Trees, "Third Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 45.7 hours/ha	210	85
Fertilizer:		
15-15-15 400 kg/ha	84	34
Am. nitrate 125 kg/ha	22	9
Insecticides	240	97
Fungicides	245	99
Herbicides	67	27
Trees, 3 replacements	35	14
Mouse bait, 5.6 kg/ha	10	4
Tractor and machine costs:		
Repairs and maintenance	79	32
Fuel	51	21
Interest on operating capital	157	63
TOTAL	1,200	485
FIXED COSTS		
Operator labor, 71.7 hours/ha	502	203
Tractor and machine costs:		
Depreciation	130	53
Interest on investment	61	25
Insurance and housing	28	11
Interest on land, $4,450/ha @ 6.3% per annum	280	113
Taxes	41	17
Other overhead	99	40
TOTAL	1,141	462
TOTAL "THIRD YEAR" COSTS	2,341	947

Table 8. - Apples on Size-Controlling Trees, "Third Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Replanting trees	a	2.47	1.0	38.52	15.59
Pruning and training	a	61.8	25.0	373.14	151.00
Fertilizing	2	7.41	3.0	79.69	32.25
Weed spraying	1	2.47	1.0	47.77	19.33
Mowing	3	3.71	1.5	88.47	35.80
Pesticide spraying	5	7.41	3.0	242.27	98.04
Summer management	a	22.2	9.0	155.68	63.00
Applying mouse bait	1	2.47	1.0	8.65	3.50
Adjusting tree guards	a	7.41	3.0	25.95	10.50

[a]Operation performed as required.

Table 9. - Apples on Size-Controlling Trees, "Fourth Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 32.1 hours/ha	157	64
Fertilizer:		
Mur. of potash, 200 kg/ha	30	12
Am. nitrate, 90 kg/ha	17	7
Insecticides	297	120
Fungicides	282	114
Herbicides	119	48
Special spray	166	67
Trees, 3 replacements	35	14
Mouse bait, 5.6 kg/ha	10	4
Tractor and machine costs:		
Repairs and maintenance	114	46
Fuel	67	27
Interest on operating capital	65	26
TOTAL	1,359	549
FIXED COSTS		
Operator labor, 63.0 hours/ha	441	178
Tractor and machine costs:		
Depreciation	185	75
Interest on investment	87	35
Insurance and housing	39	16
Interest on land, $4,450/ha @ 6.3% per annum	280	113
Taxes	41	17
Other overhead	99	40
TOTAL	1,172	474
TOTAL "FOURTH YEAR" COSTS	2,531	1,023

Table 10. - Apples on Size-Controlling Trees, "Fourth Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Replanting trees	a	2.47	1.0	38.52	15.59
Pruning and training	a	49.4	20.0	296.53	120.00
Fertilizing	2	4.94	2.0	65.04	26.32
Weed spraying	2	4.94	2.0	95.53	38.66
Mowing	4	4.94	2.0	117.92	47.72
Pesticide spraying	8	11.1	4.5	363.42	147.07
Summer management	a	14.8	6.0	103.79	42.00
Applying mouse bait	1	2.47	1.0	8.65	3.50

Table 11. - Apples on Size-Controlling Trees, Total Costs of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
Preplanting Year	1,126	455
Planting Year	8,228	3,330
Second Year	2,621	1,061
Third Year	2,341	947
Fourth Year	2,531	1,023
TOTAL	16,847	6,816

CONCLUSIONS

The total cost of establishing this size-controlling apple orchard, estimated at $6,816 per acre, should be charged over the productive life of the orchard. If the productive life of the orchard is estimated at 20 years, the establishment cost should be amortized over the 20-year period.

Since no allowance is made for inflation over the productive cycle, an amortization rate of 6.3 percent, which is the lending rate adjusted for inflation, is used. Amortizing the $6,816 establishment cost using a 6.3 percent rate gives an annual cost of $609 per acre for each year of the production period.

PEACH ORCHARD ESTABLISHMENT

The peach orchard under consideration is planted 145 trees per acre. The establishment of this orchard covers a 4½ year period: a half year for soil preparation, one year for planting, and three years for the trees to grow to bearing age.

Table 12. - Peach "Preplant Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Fumigant	455	184
Tractor and machine costs:		
Repairs and maintenance	19	8
Fuel	26	10
Custom fumigation	25	10
Interest on operating capital	197	80
TOTAL	722	292
FIXED COSTS		
Operator labor, 9.9 hours/ha	69	28
Tractor and machine costs:		
Depreciation	45	18
Interest on investment	19	8
Insurance and housing	9	4
Interest on land, $22,240/ha @ 6.3% per annum (½ yr.)	701	284
Taxes, ½ year	27	11
TOTAL	870	353
TOTAL "PREPLANT YEAR" COSTS	1,592	645

Table 13. - Peach "Preplant Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Plowing	1	2.47	1.0	51.08	20.67
Discing	2	2.47	1.0	42.97	17.39
Rotovating	1	2.47	1.0	47.74	19.32
Soil packing	1	2.47	1.0	45.07	18.24

Table 14. - Peach "Planting Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 71.7 hours/ha	277	112
Fertilizer, 15-15-15 100 kg/ha	22	9
Insecticides	94	38
Cover crop seed	10	4
Trees, 145	1,792	725
Tree guards, 145	161	65
Tractor and machine costs:		
Repairs and maintenance	80	32
Fuel	104	42
Equipment rental	124	50
Interest on operating capital	932	377
TOTAL	3,596	1,454
FIXED COSTS		
Operator labor, 35.8 hours/ha	251	101
Tractor and machine costs:		
Depreciation	170	69
Interest on investment	71	29
Insurance and housing	32	13
Interest on land, $22,240/ha @ 6.3% per annum	1,401	567
Taxes	54	22
Other overhead	99	40
TOTAL	2,078	841
TOTAL "PLANTING YEAR" COSTS	5,674	2,295

Table 15. - Peach "Planting Year" Costs: Opertion Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Discing	1	2.47	1.0	38.03	15.39
Levelling	1	2.47	1.0	35.83	14.50
Pick up trees	1	4.94	2.0	86.64	35.06
Planting trees	a	39.5	16.0	377.68	152.84
Discing	2	2.47	1.0	38.03	15.39
Harrowing	2	2.47	1.0	36.47	14.76
Hand weeding	a	7.41	3.0	25.95	10.50
Pruning	a	17.3	7.0	121.08	49.00
Pesticide spraying	3	3.71	1.5	121.13	49.02
Sowing cover crop	1	2.47	1.0	27.58	11.16
Installing tree guards	a	12.4	5.0	64.47	26.09
Mowing	4	4.94	2.0	117.92	47.72
General maintenance	a	4.94	2.0	17.30	7.00

[a]Operation performed as required.

Table 16. - Peach "Second Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 11.1 hours/ha	56	23
Fertilizer, 15-15-15 100 kg/ha	22	9
Insecticides	72	29
Fungicides	37	15
Herbicides	49	20
Cover crop seed	10	4
Trees, 10 replacements	62	25
Tractor and machine costs:		
Repairs and maintenance	63	25
Fuel	45	18
Interest on operating capital	104	42
TOTAL	520	210
FIXED COSTS		
Operator labor, 34.6 hours/ha	242	98
Tractor and machine costs:		
Depreciation	111	45
Interest on investment	51	21
Insurance and housing	24	10
Interest on land, $22,240/ha @ 6.3% per annum	1,401	567
Taxes	54	22
Other overhead	99	40
TOTAL	1,982	803
TOTAL "SECOND YEAR" COSTS	2,502	1,013

Table 17. - Peach "Second Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Replanting trees	a	4.94	2.0	34.60	14.00
Pruning	a	17.3	7.0	121.08	49.00
Discing	4	4.94	2.0	76.06	30.78
Sowing cover crop	1	2.47	1.0	27.58	11.16
Weed spraying	1	2.47	1.0	47.77	19.33
Pesticide spraying	4	4.94	2.0	161.51	65.36
Mowing	3	3.71	1.5	88.47	35.80
General maintenance	a	4.94	2.0	34.60	14.00

[a]Operation performed as required.

Table 18. - Peach "Third Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 28.4 hours/ha	142	58
Fertilizer, 15-15-15 100 kg/ha	22	9
Insecticides	358	145
Fungicides	128	52
Herbicides	49	20
Cover crop seed	10	4
Trees, 5 replacements	62	25
Tractor and machine costs:		
Repairs and maintenance	98	40
Fuel	58	23
Interest on operating capital	139	56
TOTAL	1,066	432
FIXED COSTS		
Operator labor, 32.1 hours/ha	225	91
Tractor and machine costs:		
Depreciation	157	63
Interest on investment	74	30
Insurance and housing	34	14
Interest on land, $22,240/ha @ 6.3% per annum	1,401	567
Taxes	54	22
Other overhead	99	40
TOTAL	2,044	827
TOTAL "THIRD YEAR" COSTS	3,110	1,259

Table 19. - Peach "Third Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Replanting trees	a	2.47	1.0	17.30	7.00
Pruning	a	34.6	14.0	207.57	84.00
Discing	4	4.94	2.0	76.06	30.78
Sowing cover crop	1	2.47	1.0	27.58	11.16
Weed spraying	1	2.47	1.0	47.77	19.33
Pesticide spraying	8	9.88	4.0	323.02	130.72
Mowing	3	3.71	1.5	88.47	35.80

[a]Operation performed as required.

Table 20. - Peach "Fourth Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 75.4 hours/ha	325	131
Fertilizer, 15-15-15 100 kg/ha	22	9
Insecticides	477	193
Fungicides	306	124
Herbicides	49	20
Cover crop seed	10	4
Paint and repellant	82	33
Tractor and machine costs:		
Repairs and maintenance	98	40
Fuel	58	23
Interest on operating capital	71	29
TOTAL	1,498	606
FIXED COSTS		
Operator labor, 42.0 hours/ha	294	119
Tractor and machine costs:		
Depreciation	157	63
Interest on investment	74	30
Insurance and housing	34	14
Interest on land, $22,240/ha @ 6.3% per annum	1,401	567
Taxes	54	22
Other overhead	99	40
TOTAL	2,113	855
TOTAL "FOURTH YEAR" COSTS	3,611	1,461

Table 21. - Peach "Fourth Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Pruning	a	59.3	24.0	355.84	144.00
Discing	4	4.94	2.0	76.06	30.78
Sowing cover crop	1	2.47	1.0	27.58	11.16
Weed spraying	1	2.47	1.0	47.77	19.33
Pesticide spraying	8	9.88	4.0	323.02	130.72
Mowing	3	3.71	1.5	88.47	35.80
Painting trees	a	34.6	14.0	121.08	49.00

[a]Operation performed as required.

Table 22. - Peach Total Costs of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
Preplanting Year	1,592	645
Planting Year	5,674	2,295
Second Year	2,502	1,013
Third Year	3,110	1,259
Fourth Year	3,611	1,461
TOTAL	16,489	6,673

CONCLUSIONS

The total cost of establishing this new peach orchard, estimated at $6,673 per acre, should be charged over the productive life of the orchard. If the productive life of the orchard is estimated at 15 years, the establishment cost should be amortized over the 15-year period.

Since no allowance is made for inflation over the production cycle, an amortization rate of 6.3 percent, which is the lending rate adjusted for inflation, is used. Amortizing the $6,673 establishment cost using a 6.3 rate gives an annual cost of $681 per acre for each year of the production period.

GRAPE ESTABLISHMENT

The vineyard under consideration is planted 600 vines per acre. The establishment of this vineyard covers a 4½ year period: a half year for soil preparation, one year for planting, and three years for the vines to grow to bearing age.

Table 23. - Grape "Preplant Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Tractor and machine costs:		
Repairs and maintenance	19	8
Fuel	26	10
Interest on operating capital	17	7
TOTAL	62	25
FIXED COSTS		
Operator labor, 9.9 hours/ha	69	28
Tractor and machine costs:		
Depreciation	45	18
Interest on investment	19	8
Insurance and housing	9	4
Interest on land, $11,120/ha @ 6.3% per annum (½ yr.)	350	142
Taxes (½ yr.)	27	11
TOTAL	519	211
TOTAL "PREPLANT YEAR" COSTS	581	236

Table 24. - Grape "Preplant Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Plowing	1	2.47	1.0	51.08	20.67
Discing	2	2.47	1.0	42.97	17.39
Rotovating	1	2.47	1.0	47.74	19.32
Soil packing	1	2.47	1.0	45.07	18.24

Table 25. - Grape "Planting Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 84.0 hours/ha	402	162
Fertilizer, 15-15-15 100 kg/ha	22	9
Fungicides	52	21
Grape vines, 600	2,521	1,020
Trellis materials	2,879	1,165
Cover crop seed	10	4
Tractor and machine costs:		
Repairs and maintenance	138	56
Fuel	264	106
Equipment rental	124	50
Interest on operating capital	2,244	908
TOTAL	8,656	3,501
FIXED COSTS		
Operator labor, 81.5 hours/ha	571	231
Tractor and machine costs:		
Depreciation	360	146
Interest on investment	141	57
Insurance and housing	64	26
Interest on land, $11,120/ha @ 6.3% per annum	701	284
Taxes	54	22
Other overhead	99	40
TOTAL	1,990	806
TOTAL "PLANTING YEAR" COSTS	10,646	4,307

Table 26. - Grape "Planting Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Discing	2	2.47	1.0	38.03	15.39
Levelling	1	2.47	1.0	35.83	14.50
Picking up vines & supplies ..	a	4.94	2.0	86.64	35.06
Planting	a	24.7	10.0	305.18	123.50
Trellis erection	a	89.0	36.0	1,126.57	455.90
Pesticide spraying	2	2.47	1.0	80.76	32.68
Weed control	1	4.94	2.0	90.49	36.62
Discing	2	2.47	1.0	38.03	15.39
Rotovating	2	4.94	2.0	85.60	34.64
Summer pruning & tying	a	24.7	10.0	148.27	60.00
Sowing cover crop	1	2.47	1.0	27.58	11.16

[a]Operation performed as required.

Table 27. - Grape "Second Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 66.7 hours/ha	328	133
Fertilizer:		
Am. nitrate 111 kg/ha	20	8
15-15-15 100 kg/ha	22	9
Insecticides	32	13
Fungicides	84	34
Grape vines, 30	126	51
Trellis materials	615	249
Cover crop seed	10	4
Tractor and machine costs:		
Repairs and maintenance	63	26
Fuel	67	27
Interest on operating capital	342	138
TOTAL	1,709	692
FIXED COSTS		
Operator labor, 40.8 hours/ha	285	115
Tractor and machine costs:		
Depreciation	123	50
Interest on investment	53	22
Insurance and housing	25	10
Interest on land, $11,120/ha @ 6.3% per annum	701	284
Taxes	54	22
Other overhead	99	40
TOTAL	1,340	543
TOTAL "SECOND YEAR" COSTS	3,049	1,235

Table 28. - Grape "Second Year" Costs: Operation Cost, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Replacing vines	a	7.41	3.0	37.07	15.00
Pruning	a	24.7	10.0	153.21	62.00
Tying	a	14.8	6.0	68.20	27.60
Trellis erection	a	14.8	6.0	152.64	61.77
Weed control	1	4.94	2.0	90.49	36.62
Discing	2	2.47	1.0	38.03	15.39
Rotovating	2	4.94	2.0	85.60	34.64
Pesticide spraying	3	3.71	1.5	121.13	49.02
Fertilizing	1	2.47	1.0	27.58	11.16
Summer pruning & tying	a	24.7	10.0	143.32	58.00
Sowing cover crop	1	2.47	1.0	27.58	11.16

[a]Operation performed as required.

Table 29. - Grape "Third Year: Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 65.5 hours/ha	323	131
Fertilizer:		
Mur. of potash, 420 kg/ha	64	26
15-15-15 100 kg/ha	22	9
Insecticides	116	47
Fungicides	178	72
Herbicides	49	20
Manure, 22.4 t/ha	247	100
Grape vines, 24	101	41
Cover crop seed	10	4
Tractor and machine costs:		
Repairs and maintenance	75	31
Fuel	58	23
Interest on operating capital	187	76
TOTAL	1,430	580
FIXED COSTS		
Operator labor, 38.3 hours/ha	268	108
Tractor and machine costs:		
Depreciation	144	59
Interest on investment	67	27
Insurance and housing	30	12
Interest on land, $11,120/ha @ 6.3% per annum	701	284
Taxes	54	22
Other overhead	99	40
TOTAL	1,363	552
TOTAL "THIRD YEAR" COSTS	2,793	1,132

Table 30. - Grape "Third Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours per ha	Labor hours per ac.	Labor, tractor and machine costs, $ per ha	Labor, tractor and machine costs, $ per ac.
Replacing vines	a	4.94	2.0	24.71	10.00
Pruning	a	34.6	14.0	214.49	86.80
Tying	a	14.8	6.0	68.20	27.60
Fertilizing	1	2.47	1.0	27.58	11.16
Manuring	1	3.71	1.5	86.69	35.08
Weed spraying	1	2.47	1.0	47.77	19.33
Discing	2	2.47	1.0	38.03	15.39
Rotovating	2	4.94	2.0	85.60	34.64
Pesticide spraying	5	6.18	2.5	201.89	81.70
Summer pruning & tying	a	24.7	10.0	143.32	58.00
Sowing cover crop	1	2.47	1.0	27.58	11.16

[a]Operation performed as required.

Table 31. - Grape "Fourth Year" Costs: Estimated Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
VARIABLE COSTS		
Hired labor, 66.7 hours/ha	330	133
Fertilizer:		
Am. nitrate, 170 kg/ha	32	13
15-15-15 100 kg/ha	22	9
Insecticides	208	84
Fungicides	269	109
Herbicides	49	20
Cover crop seed	10	4
Tractor and machine costs:		
Repairs and maintenance	78	31
Fuel	51	21
Interest on operating capital	51	21
TOTAL	1,100	445
FIXED COSTS		
Operator labor, 44.5 hours/ha	311	126
Tractor and machine costs:		
Depreciation	125	51
Interest on investment	58	23
Insurance and housing	26	11
Interest on land, $11,120/ha @ 6.3% per annum	701	284
Taxes	54	22
Other overhead	99	40
TOTAL	1,374	557
TOTAL "FOURTH YEAR" COSTS	2,474	1,002

Table 32. - Grape "Fourth Year" Costs: Operation Costs, Ontario, 1987

Operation	Times over	Labor hours		Labor, tractor and machine costs, $	
		per ha	per ac.	per ha	per ac.
Pruning	a	44.5	18.0	275.77	111.60
Tying	a	19.8	8.0	90.94	36.80
Fertilizing	1	2.47	1.0	27.58	11.16
Discing	2	2.47	1.0	38.03	15.39
Rotovating	2	4.94	2.0	85.60	34.64
Weed spraying	1	2.47	1.0	47.77	19.33
Pesticide spraying	6	7.41	3.0	242.27	98.04
Summer pruning & tying	a	24.7	10.0	143.32	58.00
Sowing cover crop	1	2.47	1.0	27.58	11.16

[a] Operation performed as required.

Table 33. - Grape Total Cost of Establishment, Ontario, 1987

	Cost, $	
	per hectare	per acre
Preplanting Year	581	236
Planting Year	10,646	4,307
Second Year	3,049	1,235
Third Year	2,793	1,132
Fourth Year	2,474	1,002
TOTAL	19,543	7,912

CONCLUSIONS

The total cost of establishing this new vineyard, estimated at $7,912 per acre, should be charged over the productive life of the grapery. If the productive life of the vineyard is estimated at 20 years, the establishment cost should be amortized over the 20-year period.

Since no allowance is made for inflation over the production cycle, an amortization rate of 6.3 percent, which is the lending rate adjusted for inflation, is used. Amortizing the $7,912 establishment cost using a 6.3 percent rate gives an annual cost of $707 per acre for each year of the production period.

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